Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (currently amended) A method of manufacturing substrates with a vacuum plasma treated surface comprising ~~the steps of~~:

- providing a target with a target surface;
- providing at least one substrate distant from and opposite said target surface having a substrate surface;
- generating in the volume between said target surface and said substrate surface a magnetic field pattern of
  a) a magnetron field pattern forming a closed loop considered in direction towards said ~~sputtering~~ target surface and, considered parallel to said ~~sputtering~~ target surface, tunnel-like arcing from an outer area of a first magnetic pole to an inner area of a second magnetic pole, ~~whereby~~ to confine said inner area ~~is confined~~ with respect to said outer area by a closed locus of zero component of magnetic field perpendicular to said target surface;
  b) an unbalanced long-range field pattern which is asymmetrical generated by increasing magnetic flux along said outer area relative to magnetic flux along said inner area, ~~whereby~~ said long-range field reaching the substrate surface ~~has~~ with a component of the magnetic field parallel to said substrate surface of at least 0.1 Gauss,

- generating a plasma discharge in said magnetic field pattern;
- plasma treating said substrate surface~~, thereby;~~
- wherein said method includes sweeping said asymmetrically unbalanced field pattern along said substrate surface.

2. (original) The method of claim 1, said target surface being a sputtered surface, said plasma treating being sputter-coating.

3. (currently amended) The method of claim 1, wherein said component of magnetic field parallel to said substrate surface is selected to be between 1 ~~G~~ Gauss and 20 ~~G~~Gauss.

4. (original) The method of claim 1, further comprising covering with said tunnel-like magnetron field pattern more than 60 % of said target surface.

5. (currently amended) The method of claim ~~4, thereby~~ 1, further comprising covering with said tunnel-like magnetron field pattern more than 85 % of said target surface.

6. (currently amended) The method of claim 1, ~~further comprising~~ wherein said generating said asymmetrically unbalanced field pattern ~~by~~ includes inhomogeneously increasing magnetic flux density along said outer area relative to substantially homogeneous magnetic flux density along said inner area.

7. (original) The method of claim 6, further comprising disturbing homogeneity of increased magnetic flux density by locally applying a further magnetic field along said outer area.

8. (currently amended) The method of claim 7, further comprising generating said further magnetic field by at least one magnet selected from the group consisting of a permanent magnet ~~and/or~~and an electro-magnet.

9. (previously presented) The method of claim 1, further comprising sweeping said magnetron field pattern and said unbalanced field pattern along said substrate.

10. (currently amended) The method of claim 1, ~~further comprising the step of~~ including generating said sweeping by circularly moving said unbalanced magnetic field pattern around an axis perpendicular to said target surface.

11. (currently amended) The method of claim 1, ~~further comprising the step of~~ including generating said sweeping by moving said magnetron and unbalanced field ~~patterns~~ pattern around an axis ~~perpendicularly~~ perpendicular to said target surface and offset from a geometrical center of said inner area.

12. (currently amended) The method of claim 1, ~~further comprising the step of~~ including generating said loop of said magnetron field pattern circularly around a loop central axis.

13. (currently amended) The method of claim 1, ~~further comprising the step of~~ including generating by said asymmetrically unbalanced field pattern an area of maximum plasma density adjacent the periphery of said substrate surface and wherein said sweeping includes sweeping said area of maximum plasma density adjacent to and along said periphery.

14. (currently amended) The method of claim 7, wherein said plasma treating said substrate surface includes providing a current of ions at said substrate surface, and said method further comprising adjusting uniformity of said ion current density at said substrate surface by adjusting said further magnetic field.

15. (original) The method of claim 7, further comprising generating said further magnetic field by at least one coil generating a magnetic field substantially parallel to said target surface.

16. (currently amended) The method of claim 15, ~~generating said sweeping comprising~~ including supplying said at least one coil with an alternating current for generating said sweeping.

17. (currently amended) The method of claim 15, further providing more than one of said coils generating respectively magnetic fields in different directions, ~~generating~~ said sweeping ~~comprising~~ including applying ~~alternative~~ alternating currents to said coils.

18. (currently amended) The method of claim 1, ~~further comprising~~ wherein said providing at least one substrate involves providing more than one substrate.

19. (currently amended) The method of claim ~~18~~1, further comprising ~~the step of~~ selecting said at least one substrate to be circular or ~~said more than one substrate to be~~ arranged within a circular area, and wherein said sweeping said unbalanced field pattern along said substrate surface includes sweeping said unbalanced field pattern around a center axis of said circular substrate or circular area.

20. (currently amended) The method of claim 1, wherein said plasma treating said substrate surface includes providing a current of ions at said substrate surface, and said method further comprising adjusting the current of ions at said substrate surface by adjusting ~~magnetic field~~ a component of the magnetic field perpendicular to said substrate surface.

21. (currently amended) The method of claim ~~20,~~1, further comprising ~~the step of~~ guiding an electron current in said plasma substantially perpendicular to said target surface towards said substrate surface.

22. (currently amended) The method of claim 1, further comprising ~~the step of~~ feeding said plasma by a pulsating supply voltage.

23. (currently amended) The method of claim 22, further comprising selecting frequency f of said pulsating to be

$$5 \text{ kHz} \leq f \leq 500 \text{ kHz},$$

~~preferably to be~~

~~$100 \text{ kHz} \leq f \leq 200 \text{ kHz}.$~~

24. (currently amended) The method of claim 22, further comprising selecting duty cycle of said pulsating to have 1 % to 99 % off-times (both values included)~~, to have preferably 35 % to 50 % off-times (both limits included)~~.

25. (currently amended) The method of claim 1, further comprising establishing in said volume a vacuum ~~chamber~~ having a total pressure p to be at most 10^{-1} Pa~~, preferably~~

~~$10^{-2} \text{ Pa} \leq p \leq 5 \times 10^{-2} \text{ Pa}$~~.

26. (previously presented) The method of claim 1, further comprising biasing said substrate with an Rf frequency power.

27. (currently amended) The method of claim 26, further comprising adjusting energy of ions in said plasma bombarding said substrate surface by adjusting said Rf power.

28. (currently amended) The method of claim 1, further comprising ~~the step of~~ providing said target with a sputtering surface selecting from the group consisting of titanium, tantalum and copper. ~~of one of Ti, Ta, Cu.~~

29. (currently amended) A magnetron source comprising

- a target with a target surface and an opposite surface;
- a magnet arrangement adjacent said opposite surface and having:
  - at least one first magnet subarrangement;
  - at least one second magnet subarrangement;
  - said first magnet subarrangement having a first area pointing towards said opposite surface and of one magnetic polarity;
  - said second magnet subarrangement having a second area pointing towards said opposite surface and of the other magnetic polarity;
  - said second area forming a loop around and distant from said first area;
  - said first area generating a first magnetic flux through said target surface;
  - said second area generating a second magnetic flux through said sputtering surface;
  - said second magnetic flux being larger than said first magnetic flux;
  - said second magnetic flux being unevenly distributed along said second area;
  - a sweeping arrangement moving at least said unevenly distributed magnetic flux along said ~~sputtering~~ target surface.

30. (original) The source of claim 29, wherein said second magnet subarrangement comprises a third magnet subarrangement generating an evenly distributed component of said second magnetic flux and comprising a fourth magnet subarrangement generating said uneven flux distribution.

31. (previously presented) The source of claim 30 , wherein said second area loops around a loop central axis, said sweeping arrangement comprising a drive moving said fourth magnet subarrangement around said loop central axis.

32. (previously presented) The source of claim 30, said second area looping around a central loop axis, said sweeping arrangement comprising a drive moving said second magnet subarrangement around a rotational axis offset from said loop central axis.

33. (original) The source of claim 32, wherein said central loop axis, said rotational axis and said fourth magnet subarrangement are substantially aligned in radial direction from said rotational axis.

34. (previously presented) The source of claim 29, further comprising a magnetic shield movable with respect to said second magnetic flux to generate said second magnetic flux to be unevenly distributed along said second area.

35. (previously presented) The source of claim 29, wherein said loop is circular about a loop central axis.

36. (currently amended) A magnetron treatment chamber comprising:

a magnetron source including

a target with a target surface and an opposite surface;

a magnet arrangement adjacent said opposite surface and having:

at least one first magnet subarrangement;

at least one second magnet subarrangement;

said first magnet subarrangement having a first area pointing towards said opposite surface and of one magnetic polarity;

said second magnet subarrangement having a second area pointing towards said opposite surface and of the other magnetic polarity;

said second area forming a loop around and distant from said first area;

said first area generating a first magnetic flux through said target surface;

said second area generating a second magnetic flux through said sputtering surface;

said second magnetic flux being larger than said first magnetic flux;

said second magnetic flux being unevenly distributed along said second area;

a sweeping arrangement moving at least said unevenly distributed magnetic flux along said target surface ~~as claimed in claim 29~~; and

a substrate carrier remote from and opposite to the target surface of said magnetron source.

37. (currently amended) The chamber of claim 36, further comprising an anode arrangement adjacent said substrate ~~holder~~carrier.

38. (currently amended) The chamber of claim 37, further comprising a shield confining a process area between said source and said substrate carrier and being electrically floating or on an anodic potential~~, preferably on~~ which is a more negative potential than said anode arrangement.

39. (currently amended) The chamber of claim 37, wherein said anode arrangement is hidden behind a shield arrangement and with respect to a processing volume.

40. (currently amended) The chamber of claim 37, further comprising at least one coil with a coil axis perpendicular to the ~~sputtering~~ target surface of said source.

41. (previously presented) The chamber of claim 36, wherein said substrate carrier is electrically floating or connectable to a predetermined biasing potential.

42. (new) The method of claim 22, further comprising selecting frequency f of said pulsating to be

$$100 \text{ kHz} \leq f \leq 200 \text{ kHz}.$$

43. (new) The method of claim 22, further comprising selecting duty cycle of said pulsating to have 30% to 50% off-times.

44. (new) The method of claim 1, further comprising establishing in said volume a vacuum having a total pressure p to be at most

$$10^{-2} \text{ Pa} \leq p \leq 5 \text{ X } 10^{-2} \text{ Pa}.$$

45. (new) In a method of vacuum plasma treating a surface of a substrate wherein a magnetron magnetic field pattern is generated along a target surface in a volume between the target surface and a substrate surface being vacuum plasma treated, the improvement comprising :

generating in said volume an asymmetrically unbalanced long-range magnetron magnetic field pattern, the long-range field pattern reaching the substrate surface with a component of the magnetic field parallel to the substrate surface of at least 0.1 Gauss; and

sweeping the asymmetrically unbalanced field pattern along the substrate surface.

46. (new) The method of claim 45, wherein said target surface is a sputtered surface, said plasma treating being sputter-coating.

47. (new) The method of claim 45, wherein said component of magnetic field parallel to said substrate surface is selected to be between 1 Gauss and 20 Gauss.

48. (new) The method of claim 45, further comprising sweeping both said magnetron field pattern and said unbalanced field pattern along the substrate.